OBJECTIVE: BASELINE PERFORMANCE EVALUATION

As a condition of the Environmental Cooperation Pilot Program (ECPP), CCP must perform and submit to the DNR a baseline performance evaluation covering their environmental performance.

As part of the baseline evaluation CCP shall prepare a case study including information on environmental performance and costs prior to implementing the waste minimization/pollution project for the wastes burned in the hazardous waste incinerator before and projected after closure of the hazardous waste incinerator.

As part of the performance evaluation done in the year after closure of the incinerator, CCP shall update the case study to reflect the environmental performance and costs/savings that were experienced as a result of the project. As appropriate, CCP shall also report in the case study on their progress in achieving other goals of the Environmental Cooperative Agreements Pilot Program (s. 299.80, Wis. Stats.).

CASE STUDY - WASTE MINIMIZATION IN RESIN MANUFACTURING

Project Summary

This Environmental Cooperative Agreement provides the structural framework for Cook Composites and Polymers Co. (CCP) and Wisconsin Department of Natural Resources (DNR) to reprioritize and focus their resources to evaluate the feasibility and desirability of a waste minimization project to eliminate generation of five million pounds of a characteristic hazardous waste and the need for a hazardous waste incinerator.

Specifically CCP committed to cease burning hazardous waste in its incinerator by September 30, 2001. As part of this agreement, CCP also committed to establish an environmental management system, and seek other opportunities for waste minimization, pollution prevention, product stewardship and other environmental benefits at CCP's Saukville, Wisconsin facility in cooperation with its neighbors, its customers, the local community and DNR.

CCP Background Information

The CCP Saukville facility manufactures polyester and alkyd resins used in a variety of applications including the coatings, sanitary, automotive and marine industries (SIC 2821and 2851). The facility, located approximately 25 miles north of Milwaukee, began resin production in 1949 and employs approximately 75 full-time staff in Wisconsin.

CCP acquired the Saukville facility and other assets in December 1990 from Freeman Chemical Corporation. CCP is a joint venture company with TOTAL COMPOSITES INC., a subsidiary of the French oil, gas, refining, and chemical company TOTAL FINA ELF S.A., and Cook Composites Inc. of Kansas City, MO. CCP operates in the ATOFINA chemical branch of TOTAL FINA ELF.

The CCP Saukville current production capacity is approximately 52 million pounds of resin per year, produced in more than 3000 batches. Waste streams generated at the facility consist primarily of reaction water, spent solvents, filter cleaning residues, and miscellaneous off-spec materials. The facility historically disposed of two of the waste streams (reaction water and solvents) using an onsite RCRA licensed hazardous waste incinerator.

BASELINE HAZARDOUS WASTE GENERATION

In 2000, the CCP Saukville facility **generated approximately five (5) million pounds of a characteristic hazardous waste stream known as "esterification water"**, or more commonly **"reaction water"**. The reaction water is a by-product of a condensation reaction of organic acids and glycol that yields polyester and alkyd resins.

The reaction water waste stream was incinerated on site in a facility permitted under the Resource Conservation and Recovery Act (RCRA). The reaction waste water stream is considered characteristically hazardous for ignitability (DOO1) based on the presence of low concentrations (<1%) of volatile organic chemicals, primarily xylene, that at times result in a flash point below 140 degrees F. The waste is occasionally characteristically hazardous for corrosivity (DOO2) due to low (<2 units) pH.

Further, in 2000, the CCP Saukville facility **generated approximately 1.8 million pounds of spent solvent (F003)** that was burned in the incinerator. Since the solvent has been used as supplemental fuel to incinerate reaction water, the option of recycling the solvent was historically not considered economically attractive.

ECPP TARGETS AND RESULTS

Commitment to Regulatory Schedule

CCP recognized the economic, environmental, and community relations benefits associated with moving to waste minimization and pollution prevention approach for management of its hazardous wastes. The primary challenge was to synchronize CCP's technical and business evaluation of waste minimization and pollution prevention options with the regulatory requirements and regulatory review of Wisconsin DNR and U.S. EPA staff from many different environmental programs.

All regulatory reviews were completed in a timely manner which allowed CCP to meet its target for ending hazardous waste incineration.

Cost Savings from Regulatory Flexibility

CCP revised and updated the incinerator's Hazardous Waste Facility Feasibility and Plan of Operation Report (FPOR) according to the schedule in the DNR "call-in" letter. CCP did not request waste stream changes in the updated Feasibility and Plan of Operation Report (FPOR).

As a result, CCP was not required to provide a new trial burn test for the remaining period of operation, and CCP saved over $400,000 in consultant and contractor direct costs, and hundreds of hours of CCP staff time. A trial burn test is normally conducted prior to licensing a facility, or before a 10-year permit renewal approval. The WDNR also saved a very large (but not yet defined) amount of staff time because it was not necessary to review work plans and tests for a CCP facility that was about to close.

Reaction Water Waste Minimization

CCP evaluated the viability of waste minimization and pollution prevention options for management of reaction water at the Saukville facility, and other CCP facilities in the United States. CCP commissioned a pollution prevention study specifically focused on recovery of the ignitable constituent xylene from the reaction water.

The purpose of the study was to evaluate options for reducing hazardous waste generated by eliminating the hazardous characteristics of the water. The reaction water study focused on a new, Macro Porous Polymer – Extraction (MPPE) technology developed by Akzo Nobel Inc. CCP also planned to make beneficial use of recovered xylene from reaction water, as well as the waste azeotrope xylene and rinse xylene.

CCP committed to and implemented the MPPE technology to cease the burning of hazardous waste in its incinerator by September 30, 2001. This is two years before it would be required to do so under regulations promulgated by the US Environmental Protection Agency (US EPA). CCP received approval from WDNR for RCRA regulatory closure of the CCP hazardous waste incinerator in June 2002.

Community Relations and Stakeholder Involvement

CCP utilized its pre-existing community relations activities to meet with the public, obtain public opinion feedback on its overall environmental performance, and share information about its proposed Environmental Cooperation Agreement and waste minimization project. Existing community relations included routine presentations to the Village of Saukville Board, annual open house for the Village Board at the Saukville facility, and periodic hosted luncheon meetings of the Saukville Chamber of Commerce.

Many of the CCP Saukville employees are represented by a labor union such as the United Auto Workers. All employees of CCP are obvious stakeholders in CCP's environmental and business strategies. As such, CCP management and hourly union employees participate in the planning and implementation of this program.

Some of the activities that CCP undertook specifically for the development of this agreement are listed below.

- On June 7, 2000 CCP held an open house with the Saukville Village Board and provided a briefing on the proposed waste minimization project and Environmental Cooperative Agreement.
- In June 2000, CCP hired a facilitator to develop an outreach program and community stakeholder group (e.g. interested persons group) to support this environmental cooperative agreement project and the development of CCP's environmental management system (EMS).
- July 31, 2000 CCP held a public meeting on its Environmental Cooperative Agreement and its intent to comply with Clean Air Act MACT requirements through closure of its hazardous waste incinerator.
- CCP sent questionnaires to neighbors and selected community members to determine their environmental concerns, the way(s) they would like to interact with CCP and if they want to be a "stakeholder" and summarized the results.
- CCP invited people to participate in the CCP Advisory Committee.
- On January 11, 2001 CCP held its first meeting of the CCP Advisory Committee.

CCP provide an ongoing opportunity for community information exchange and dialogue, to the extent possible, relating to all aspects of CCP environmental activities:

These environmental activities include but are not limited to:

- The implementation of this environmental cooperative agreement;
- RCRA closure activities related to it Hazardous Waste Incinerator;
- Other waste minimization and pollution prevention activities;
- The development and implementation of CCP's Environmental Management System (EMS);
- Ongoing cleanup activities initiated as part of Correction Action in 1994;
- Environmental concerns of CCP, it's neighbors, the local community and DNR; and
- Overall environmental performance of CCP.

Community Advisory Committee

1. CCP established an ongoing Community Advisory Committee attempting to involve all relevant constituencies within the community including but not limited to:

    - Neighbors,
    - CCP Employees,
    - Area businesses,
    - Local elected and appointed officials,
    - University faculty
    - DNR staff,
    - Local Emergency Planning Committee,
    - Public Works Department,
    - Fire Department,
    - Citizen groups,
    - Neighborhood associations,
    - Others in the greater Saukville area who may be affected by or interested in the CCP facility and its activities.

2. The CCP Community Advisory Committee has met quarterly at CCP since January 2001, unless otherwise agreed upon by the committee. The meetings dates were May 2001, August 2001, December 2001, April 2002, July 2002, and October 2002. Meetings are open to the public, and open public comment is allowed at a set time on each agenda.

3. CCP maintains an up-to-date list of the individuals participating on the Community Advisory Committee. CCP will provide an up-to-date committee membership list and other information including agendas and meeting summaries to members of the advisory committee, the DNR, and the Saukville Public Library.

Community Outreach

CCP committed to provide additional opportunities for information exchange and dialogue with the community through implementation of its outreach plan including:

1. CCP developed a newsletter that can be used to regularly communicate with the advisory committee, and all residences and businesses in Saukville and others who indicate an interest in CCP and its environmental performance.

2. CCP developed prototype chemical fact sheets for the local community and neighbors (Completed for DCPD and ethylene glycol)

3. CCP plans publicized opportunities for plant tours for the general public and groups in 2003.

4. CCP repeated the Community Survey *biennially* (a change from original ECA) to gauge how public perception of CCP's environmental performance changes. The second survey was conducted in 2002 (200 surveyed / 50 responded), and the results were shared at the October 2, 2002 Community Advisory Committee meeting.

5. CCP provides access to information relevant to CCP's Environmental Cooperation Agreement, environmental performance, the advisory committee at the Saukville public library.

6. CCP provides information to the local media and encourages them to regularly provide information to the community about CCP process changes and environmental activities.

7. CCP provides additional opportunities for community information exchange and dialogue as appropriate.

Community Relations Evaluation

1. CCP will annually review the outreach plan with its Community Advisory Committee and adjust the program as necessary, providing a summary of changes as part of its annual performance evaluation.

2. CCP will report on its Community Advisory Committee and Outreach Activities as part of its annual performance evaluation

Environmental Management Systems

CCP has begun to implement an environmental management system that is based on the standards for environmental management systems issued by the International Organization for Standardization or that has equivalent components. Kestrel Management Services has been retained by CCP to assist in the training, coaching and facilitation of the working group charged with implementation of an integrated environmental management system (EMS).

CCP has already developed management system programs in the context of the industry initiatives of Coatings Care (National Paint and Coatings Association) and Composites Care (Composite Fabricators Association).

CCP plans to use the Prosper™ auditing system, developed by the international quality and safety and environment (QSE) management systems company Det Norske Veritas (DNV), or a suitable equivalent, to document that it has implemented an EMS. The management system will be based on the standards for environmental management systems issued by the International Organization for Standardization (ISO), or have equivalent components.

DNV is an internationally recognized registrar for ISO 9000 and ISO 14000 standards. The Prosper™ system integrates Quality, Safety and Environment (QSE) programs into a consistent and objective auditing framework. CCP Saukville is currently ISO 9002 certified. CCP will be implementing an integrated (QS&E) management system to apply the same continuous improvement principles to quality, safety and environmental activities.

Data to help evaluate the impacts of implementing the environmental management system will be collected pursuant to the data protocols developed by the University of North Carolina.

COMMITMENT TO SUPERIOR ENVIRONMENTAL PERFORMANCE

Goals for CCP Saukville Facility

As part of CCP's commitment to Superior Environmental Performance CCP committed to going beyond what would otherwise be required in environmental regulations by setting the following goals for its Saukville facility:

- Through waste minimization and pollution prevention eliminate or significantly reduce the waste streams that are currently burned in its hazardous waste incinerator without transferring them to another environmental media.
    - ✓ Through its waste minimization efforts CCP has eliminated the onsite incineration of nearly seven million pounds of hazardous waste annually.
    - ✓ CCP has used **source reduction** to reduce xylene solvent usage by 300,000 pounds in its first year, and expects further reductions in 2002-2003.
    - ✓ CCP has recovered between 10,000 to 25,000 pounds of xylene from the reaction water using the MPPE system.
    - ✓ CCP recycled and reused approximately 600,000 pounds of rinse xylene solvent
    - ✓ CCP managed 900,000 pounds of solvent waste by beneficial reuse for energy recovery (e.g. cement kiln)
- To establish a long-term reduction in the amount of wastes generated and contaminants and pollutants released giving priority to those pollutants, contaminants and wastes of highest health and environmental concern (SEE ABOVE)
- Through implementation of CCP's Environmental Management System continuously improve its practices to minimize environmental impacts and conserve natural resources and to work cooperatively with its neighbors, the local community and others in these efforts.
- To take leadership in product stewardship, integrating health, safety and environmental considerations into the design, development and improvement of products.
    - ✓ CCP Saukville has played a pivotal role in the commercial development of low-styrene (low HAP) composite resins and water based alkyd/acrylic dispersions for water based stains.
- In partnership with its customers strive to encourage continued environmental stewardship in the use and ultimate disposal of its products.

KEY ELEMENTS & STATUS OF CCP WASTE MINIMIZATION

The transition of CCP Saukville from hazardous waste incineration to waste minimization and pollution prevention strategies included the following key elements:

- Implement the MPPE process to recover xylene from reaction water waste and eliminate its hazardous characteristic of ignitablity (waste minimization)
  - ✓ Status: Complete September 30, 2001

- Reduce the amount of solvent used in rinse and cleaning activities (source reduction)
  - ✓ Status: Complete/Continuing: Plant team focusing on source reduction

- Segregate the solvent waste streams of ***azeotrope solvent*** (for removal of water during cook) from the ***rinse solvent*** used to clean reactor vessels, tanks, and piping
  - ✓ Status: Complete with August 2002 capital improvement of tanks

- Identify and implement services for off site solvent recycling and return program that meets CCPs technical standards (recycling)
  - ✓ Status: Complete with partnership with Brenntag for rinse solvent recycling and return to CCP

- Identify and implement options for beneficial reuse of solvent for energy recovery if the solvent is not suitable for recycling (beneficial reuse)
  - ✓ Status: Complete with Brenntag contract for energy recovery of azeotrope solvent

- Identify options for use of non-recyclable spent solvent in wide specification industrial applications (beneficial reuse – waste exchange)
  - ✓ Status: Under evaluation with Envirosafe and other vendors

- Identify options for recovery of glycol from reaction water
  - ✓ Status: Glycol recovery feasibility completed – distillation was only viable and demonstrated option. Not feasible at this time due to potential impact of distillation water vapor on thermal oxidizer reliability and no energy conservation benefit.

  - ✓ CCP was awarded a grant from *Wisconsin Focus on Energy* to fund research at UW-Madison on the photocatalysis of VOCs in reaction water. If trace levels of odor causing semi-volatile compounds can be selectively destroyed, the glycol/water may be more amenable to distillation recovery of glycol.

- Evaluate feasibility of on site solvent recovery
  - ✓ CCP evaluated the feasibility of an agitated thin film evaporator, the only technology appropriate for solvent-resin mixes. The payback period is not competitive because a cost-effective local recycling service is available, and the plant has reduced the solvent usage that diminishes return on investment.

TABULATED RESULTS OF CCP WASTE MINIMIZATION ACTIVITY

SOLVENT WASTE

	Solvent Waste (lbs/year)	Solvent Cost Savings ($/year)	Solvent Incinerated (lbs/year)	Solvent Recycled (lbs/year)	Beneficial Reuse (lbs/year)
Pre - ECA	**1,800,000**	**0**	**1,800,000**	**0**	**0**
Post – ECA (2001-2002)	**1,500,000**	**$120,000**	**0**	**600,000**	**900,000**

NATURAL GAS USAGE

	Monthly Gas Usage MM BTU/ month)	Monthly Gas Cost ($ / month)
Pre – ECA	**6,000 to 8,000**	**$40,000 to $60,000**
Post – ECA	**8,000 to 10,000**	**$40,000 to $70,000**

REACTION WATER

	Hazardous Waste Incinerated (lbs/year)	Xylene Recovered (lbs/ year)	Glycol Lost (lbs / day)
Pre – ECA	**5,000,000**	**0**	**800**
Post – ECA	**0**	**25,000**	**800**